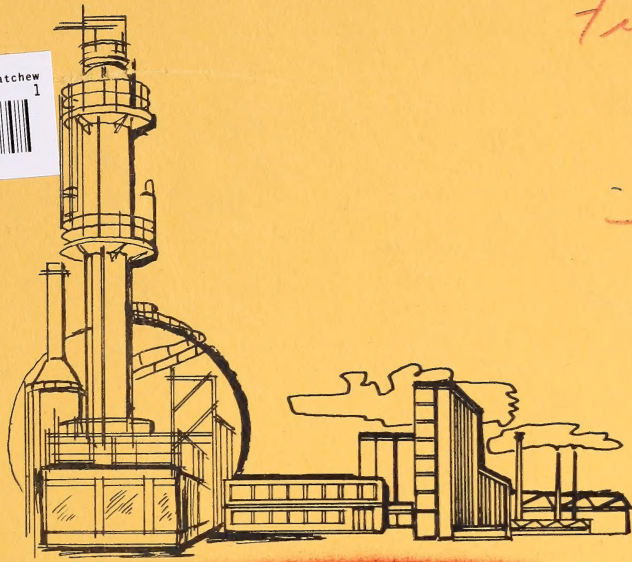


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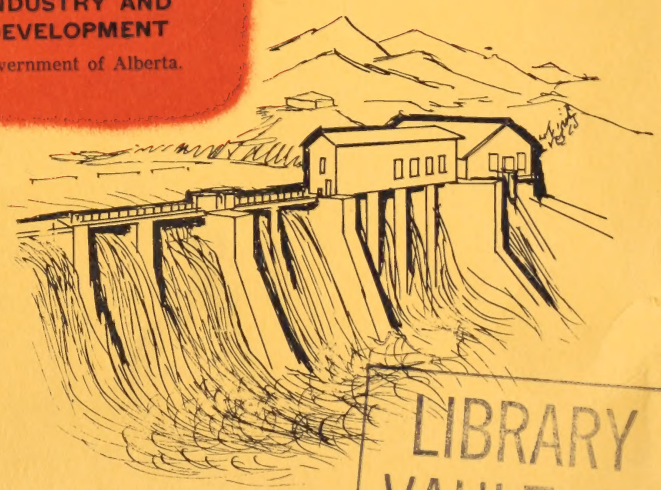
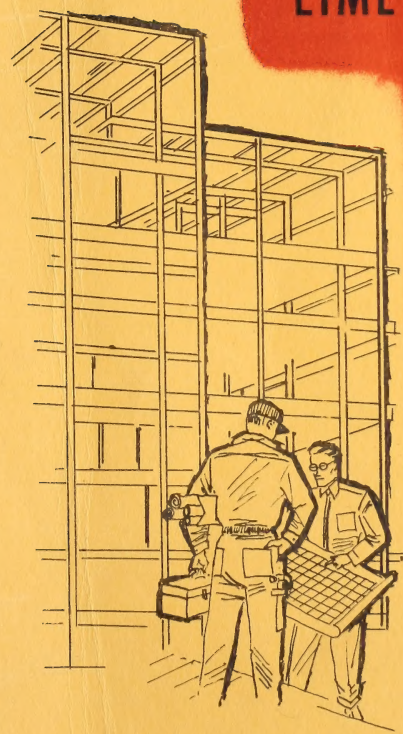
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# Report on LIME CONSUMPTION



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INTRODUCTION

SCOPE

DEFINITIONS - GENERAL

DEFINITIONS - LIME

NORTHERN ALBERTA AND

NORTHERN SASKATCHEWAN

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DEFINITIONS



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APPENDIX

Prepared by the Alberta Bureau of Statistics,  
Department of Industry and Development,  
EDMONTON -- Alberta.

July 20th, 1961.



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Department of Economic Development  
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1000 - 10th Street, S.W.  
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1991

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NORTHERN ALBERTA AND NORTHERN SASKATCHEWAN LIME MARKET

JULY - 1960

-----

INTRODUCTION:

Limestone is an essential raw material of an industrial economy and, because of its low costs and bulk required, deposits must be situated comparatively close to manufacturing centres.

In Alberta, limestone is used chiefly for the manufacture of cement and lime.<sup>1</sup>

Lime itself may be used for medicinal purposes, insecticides, plant and animal food, gas absorption, precipitation, dehydration and causticizing. It is employed as a reagent in the sulfite process for paper making, dehairing hides, recovering by-product ammonia, manufacturing of high grade steel and cement, water softening, manufacturing of soap, rubber, varnish, refractories, and sand-lime brick. It is indispensable for mortar and plaster use and serves as a basic raw material for calcium salts and for improving the quality of certain soils.

Lime is sold as a high calcium quick lime containing not less than 90 per cent of calcium oxide and from 0 to 5 per cent of magnesium with small percentages of calcium carbonate, silica, alumina, and ferric oxide present as impurities.<sup>2</sup> The suitability of lime for any particular use depends on its composition and physical properties, all of which can be controlled by the selection of the limestone and the detail of the manufacturing process. Much lime must be finely ground before use.

Depending on the composition, there are several distinct types of limes. Hydraulic limes are obtained from the burning of limestone containing clay, and the nature of the product obtained after contact with



water varies from a putty to a set cement. The high-calcium-content limes harden only by absorption of carbon dioxide from the air, which is a slow process; hydraulic limes also harden slowly but they can be used under water. For chemical purposes high-calcium lime is required except for the sulfite paper process where a magnesium lime works better.

PRODUCTION:

In Southern Alberta, lime is produced by three firms at five locations. Loders Lime Company Ltd., quarries limestone and produces lime at Kananaskis, Alberta. Summit Lime Works Ltd., quarries limestone in the Crowsnest Pass area, produces lime there and also supplies the Canadian Sugar Factories Ltd., with limestone for the production of lime at Picture Butte, Taber and Raymond. This lime is used in their sugar refining operations.

The lime produced in Alberta is a high calcium lime which finds ready use in the construction trade, in water treatment plants and in manufacturing firms throughout the province.

In 1959, Alberta lime production totalled 43,709 tons for a value of \$742,000 (See Table II)

Alberta producers supply all of the Provinces' needs as well as supplying some lime for export.

Saskatchewan must import virtually all of its requirements of lime.

LIMESTONE DEPOSITS - NORTHERN ALBERTA:

There are six major limestone deposits in Northern Alberta which could be economically exploited. However, of these six deposits, three (Roche Miette, Henry House and Brule) are in Jasper National Park, and





their exploitation is therefore prohibited by law. Only the deposits outside the park will be discussed.

ANALYSIS OF DEPOSITS:

(1) NORDEGG:

About 4.5 miles east of Nordegg, a thick succession of impure cherty limestone of Devonian Mississippian Age is exposed along the Canadian National Railway and has been described by (Goudge 1944). Relatively pure limestone occurs in the sequence in layers up to 50 feet thick. Analysis 14 is representative of one 50 foot layer described by Goudge as occurring a few hundred yards northeast of Mile 146 on the railway.

One mile east of Nordegg, at Mile 148.5 on the Canadian National Railway, a small quarry has been opened for ballast in a twenty foot bed of limestone of which the upper 10 feet is pure. West of the quarry, a 40 foot bed of pure limestone is exposed. Analysis 15 and 16 were made by Goudge on the 10 and 40 foot beds respectively.<sup>3</sup>

(2) CADOMIN:

"Devonian Mississippian Limestone is exposed along the Canadian National Railway Mountain Park Line for approximately 500 feet immediately north of the 25 mile post (Goudge 1944). The strata strike east and dip to the south (35 to 60 degrees). Analysis 17, represents a channel sample, taken by Goudge of the most northerly 300 feet of the exposures which are from 180 to 250 feet in thickness. Several cherty beds occurring in the sequence were not sampled. Analysis 18 represents the southerly 200 feet of the exposure which is 100 to 175 feet in thickness.

South of the 25 mile post a small ridge of limestone outcrops near the railway, just north of Cadomin Creek. Analysis 19 is represent-

*[The page contains extremely faint, illegible text, likely bleed-through from the reverse side of the document. The text is scattered across the page and cannot be transcribed.]*



ative of this material".

(3) McMURRAY:

Beaverhill Lake Limestone of Upper Devonian Age is exposed near river level at the junction of the Clearwater and the Athabasca Rivers. A grab sample of the limestone was collected by the Research Council of Alberta from the north bank of the Clearwater at its junction with the Athabasca, immediately across the Clearwater River from McMurray. Analysis 25 is representative of this sample.<sup>5"</sup>

---



T A B L E I

## SELECTED ANALYSIS FROM TABLE 4:

Chemical Analysis of Limestone  
Discussed in the Research Council of Alberta,  
Geological Division, Preliminary Report 58 - 2, p. 66

Analysis Number	Name of Deposit	Thickness in Feet	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	Ca <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	CaCO <sub>3</sub>	MgCO <sub>3</sub>	TOTAL	CaO	MgO
14	Nordegg	50	5.26	0.49	1.73	0.13	85.62	6.56	99.79	48.02	3.14
15	Nordegg	10	0.42	0.06	0.17	0.02	95.25	4.20	100.12	53.37	2.01
16	Nordegg	40	0.24	0.04	0.21	0.02	97.96	2.00	100.47	54.87	0.95
17	Cadomin	150	0.98	0.23	0.29	0.02	92.45	5.90	99.87	51.78	2.82
18	Cadomin	100	1.14	0.24	0.22	0.02	96.00	1.83	99.45	53.77	0.87
19	Cadomin	Unknown	0.98	0.30	0.22	0.01	95.03	3.01	99.55	53.22	1.44
25	McMurray	Unknown	1.66	0.21	1.28	n.d.	95.18	1.11	99.44	53.33	0.53




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T A B L E II

PRODUCERS SHIPMENTS\* OF LIME

SHOWING PURPOSE FOR WHICH USED OR SHIPPED--ALBERTA 1957-1959

	1 9 5 7		1 9 5 8		1 9 5 9	
	Quantity tons	Value \$	Quantity tons	Value \$	Quantity tons	Value \$
<u>Quick Lime Building Trades:</u>						
Finishing Lime	8,567	124,377	8,537	126,750	13,374	220,760
Masons Lime	3,345	58,432	4,000	73,400	-**	-**
<u>Industrial:</u>						
Non-Ferrous Smelters	3,744	54,928	3,713	56,294	2,242	29,146
Iron and Steel Furnaces	3,000	52,410	3,200	58,720	1,120	11,608
Cyanide and Flootation	60	780	234	3,042	-	-
Pulp and Paper Mills	-	-	-	-	240	4,320
Sugar Refineries	12,399	198,544	14,073	225,168	11,483	229,660
Sand-Lime, Brick Plants	-	-	-	-	839	8,390
Insecticide Plants	-	-	-	-	150	2,700
Other Industrial Uses	1,500	26,205	1,151	21,121	-	-
Other Consumers	4,420	75,340	3,860	68,950	6,660	118,080
<u>Total Quick Lime:</u>	37,035	591,016	38,768	633,445	36,108	624,664

Shipped from Plants in Alberta.

\*Includes Amounts used in Producers own works.

\*\*Reports not received before publication.



T A B L E II (Continued)

	<u>1 9 5 7</u>		<u>1 9 5 8</u>		<u>1 9 5 9</u>	
	<u>Quantity</u>	<u>Value</u>	<u>Quantity</u>	<u>Value</u>	<u>Quantity</u>	<u>Value</u>
	<u>tons</u>	<u>\$</u>	<u>tons</u>	<u>\$</u>	<u>tons</u>	<u>\$</u>
<u>Hydrated Lime:</u>						
<u>Building Trades</u>						
Finishing Lime	1,525	22,525	2,187	32,335	3,485	51,245
Masons Lime	1,100	21,733	2,200	39,336	-	-
<u>Industrial:</u>						
Uranium Plants	-	-	-	-	1,052	17,884
Non-Ferrous Smelters	90	1,170	125	1,625	45	585
Cyanide and Flotation Mills	584	7,590	960	12,480	380	4,940
Fertilizer Plants	-	-	-	-	-	-
Other Industrial Uses	870	17,183	1,600	28,608	1,558	26,486
Other Consumers	1,019	17,020	1,272	19,783	1,081	16,033
<u>Total Hydrated:</u>	<u>5,188</u>	<u>87,221</u>	<u>8,344</u>	<u>134,167</u>	<u>7,601</u>	<u>117,173</u>
<u>GRAND TOTAL</u> .....	<u>42,223</u>	<u>678,237</u>	<u>47,112</u>	<u>767,612</u>	<u>43,709</u>	<u>741,837</u>





CONSTRUCTION:

Residential: As is indicated by the following table, the greatest proportion of dwelling units constructed in Northern Alberta have been built in the city of Edmonton.

T A B L E    I I I

CONSTRUCTION OF DWELLING UNITS  
CENTRES OF 5,000 POPULATION OR MORE  
NORTHERN ALBERTA 1956 - 1960

	1956	1957	1958	1959	1960
CAMROSE - Started	-	21	39	65	76
- Completed	-	32	25	59	85
EDMONTON - Started	3,203	3,320	5,805	4,004	2,180
- Completed	3,350	3,957	4,702	4,995	3,328
GRANDE PRAIRIE - Started	-	60	151	79	78
- Completed	-	42	171	59	72
LLOYDMINSTER - Started	-	9	20	57	53
- Completed	-	-	16	50	27
RED DEER - Started	131	153	264	315	163
- Completed	180	107	214	312	227
T O T A L - Started	3,333	3,563	6,279	4,520	2,550
- Completed	3,530	3,138	5,128	5,475	3,739
5 year Average 1956 - 1960 -- Started		4,049			
-- Completed		4,202			
5 year Average 1953 - 1957 -- Started		3,702			
-- Completed		3,727			

Over the past five years, approximately 4,200 dwelling units (see Table III) have been completed in Northern Alberta.

Because of the growing trend to drywall construction, the Lath and Plaster Institute of Alberta, the Edmonton House Builders Association, Central Mortgage and Housing Corporation, three plaster contractors and

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three drywall manufacturers were contacted in an attempt to determine what percentage of houses are of drywall construction as compared to those constructed from plaster and stucco.

Three estimates were for 50 per cent drywall and 50 per cent for plaster and stucco. The other six estimated were 40 per cent for drywall and 60 per cent for plaster and stucco. The 60 per cent figure also includes houses which have drywall inside and stucco on the outside. It was felt that this latter ratio would prevail for several years to come.

There is approximately 1,200 pounds of lime used in a house which is finished with plaster and stucco. For the purpose of this report it was assumed that each dwelling unit would approximate 1,000 square feet of floor space and that larger homes would tend to balance off against smaller apartments.

Of the 4,200 completed houses in Northern Alberta, 60 per cent or 2,520 would require  $2,520 \times .6$  tons = 1,512 tons of lime.

In Northern Saskatchewan there is an average of 1,550 houses (See table VI) completed per year of which 60 per cent or 930 would require lime for plaster and stucco work. On this basis,  $930 \times .6 = 558$  tons of lime would be required.

The amount of lime required for residential construction in other urban and rural centres in Northern Alberta and Northern Saskatchewan would be approximately 600 tons.

If the present rate of residential construction continues in the future as it has in the past, in Northern Alberta and Saskatchewan, there will be a market for at least 2,670 tons of lime per year for residential construction.





INDUSTRIAL AND COMMERCIAL:

In addition to the figures (Table IV) for lime used in residential construction there is the lime which is used for industrial and commercial construction. Here the estimates are much more difficult to make since there are no average sizes for industrial or commercial structures. Consequently, again only an estimate can be made for the amount of lime required for this type of construction.

It was felt that there is more lime used in plaster, stucco and masonry work in industrial and commercial structures than there is in residential buildings. Therefore, it was estimated that approximately 2,000 tons of lime might be used for industrial and commercial construction in Northern Alberta while 775 tons would be used for the same purpose in Northern Saskatchewan.

The persons contacted regarding the requirements for lime for residential construction felt that the estimated requirements of lime for industrial and commercial construction were as reliable as they could possibly be under the circumstances. There is no published data available which provides a detailed breakdown of the type required for a study of this nature.

---



T A B L E IV

VALUE OF RESIDENTIAL AND NON-RESIDENTIAL CONSTRUCTION  
METROPOLITAN EDMONTON 1956 -- 1960

Year	Total Residential \$000	Industrial \$000	Commercial \$000	Institutional & Government \$000	Other \$000	Total Non-Residential \$000	Total Residential and Non-Residential \$000
1956	39,110	10,045	20,036	11,817	465	42,363	81,673
1957	41,058	4,745	17,331	11,371	407	33,854	74,912
1958	58,238	6,573	15,613	15,085	383	37,654	95,892
1959	61,096	7,086	20,830	18,111	54	46,081	107,177
1960	30,053	4,268	14,110	21,530	135	40,041	70,096
5 year Average	45,951	6,543	17,584	15,583	288	39,999	85,950
1953-57 Average	38,212	5,564	13,604	11,987	459	31,614	69,826





Both the preceding tables show substantial increases in the 5 year averages (1956 - 60 over 1953 - 57) in all classifications except in the "Other" group in the latter table.

However, care must be exercised in using these averages since they cover up any substantial increase or decrease from year to year.

For example, in Edmonton in 1958, 2,485 more houses were started in the city than in 1957. In 1960, there was a slump in new residential construction, and only 2,180 dwelling units were started. This is 1,824 units less than were started in the previous year.

These averages have been determined merely as an aid in calculating the requirements of lime in residential construction. Because construction activities fluctuate a great deal from year to year, anyone using these averages should also consider the starts and completion figures for each individual year in order to obtain a more realistic analysis.

---



T A B L E V

CONSTRUCTION OF DWELLING UNITS IN URBAN CENTRES OF 5,000 POPULATION AND OVER  
NORTHERN SASKATCHEWAN 1956 -- 1960

	1956	1957	1958	1959	1960
LLOYDMINSTER - Started	-	-	-	10	34
- Completed	-	-	-	4	26
NORTH BATTLEFORD - Started	40	86	199	126	66
- Completed	39	101	120	135	101
PRINCE ALBERT - Started	122	259	258	331	130
- Completed	113	182	329	271	178
SASKATOON - Started	990	1,080	1,481	1,629	1,137
- Completed	878	1,103	1,349	1,325	1,548
5 year Average 1956	- Started				
	1,595				
- Completed					
	1,560				





T A B L E VI

VALUE OF RESIDENTIAL AND NON-RESIDENTIAL CONSTRUCTION  
NORTH BATTLEFORD, PRINCE ALBERT AND SASKATOON, SASKATCHEWAN 1958 - 1960

Year	Total Residential \$000	Industrial \$000	Commercial \$000	Institutional & Government \$000	Other \$000	Total Non-Residential \$000	Total Residential and Non-Residential \$000
1958	20,811	1,161	5,899	8,526	8	15,594	36,405
1959	24,203	1,591	4,836	9,950	8	16,385	40,588
1960	14,691	2,714	7,298	7,695	10	17,717	32,408
3 year Average	19,901	1,822	6,011	8,727	9	16,565	36,467



T A B L E VII

CONSUMPTION OF LIME IN MUNICIPAL WATERWORKS  
1948 - 59 Excluding 1952-55  
(Pounds)

Year	Alberta	Saskatchewan	Manitoba	Canada
1959	13,790,723	1,209,538	3,139,937	22,592,534
1958	11,856,578	964,285	3,518,558	20,166,085
1957	11,963,444	1,058,784	2,524,584	18,937,351
1956	10,929,644	103,575	2,663,300	17,099,939
1951	6,988,700	-	1,564,900	11,094,000
1950	6,939,600	-	1,600,600	10,679,000
1949	7,716,690	-	2,057,250	12,063,182
1948	6,594,854	-	892,450	9,756,048





WATER TREATMENT:

City of Edmonton:

The City of Edmonton Water Treatment Plant used 7,036 tons of lump quicklime (crushed to one inch and smaller) for water softening in 1960. The lime used for water softening must meet the standards set by the American Water Works Association. These specifications require that the lime must be of a grade which contains 88 per cent of CaO. Lime with a CaO content of over 88 per cent is bought at a bonus of 2 per cent of the invoice price for each 1 per cent of CaO over the required 88 per cent. A corresponding penalty is charged for lime of less than 88 per cent purity. During 1960 the price for lime delivered to the Edmonton Water Treatment Plant was \$21.60 per ton (excluding the bonus). The bonus, during 1960 averaged approximately 9 per cent. This brings the cost of the lime delivered in Edmonton to \$23.54 per ton. The lime is shipped by hopper-bottom rail cars from Southern Alberta and then delivered by truck to the plant.

The following table shows the consumption of lime at the Edmonton Water Treatment Plant during 1960.

T A B L E VIII

CONSUMPTION OF LIME--EDMONTON WATER TREATMENT PLANT

	<u>Tons per Month for 1960</u>
January	609
February	701
March	625
April	534
May	682
June	555
July	495
August	455
September	397
October	534
November	650
December	<u>799</u>
T O T A L	7,036 tons

10/10/10

### Introduction

The purpose of this report is to provide a comprehensive overview of the current state of the market and to identify key trends and opportunities. The analysis is based on a thorough review of industry data and expert insights.

The market has shown significant growth over the past few years, driven by increasing demand for high-quality products and services. This growth has been supported by a strong economy and favorable regulatory environment.

Key factors influencing the market include technological advancements, changing consumer preferences, and global trade dynamics. These factors are expected to continue to shape the market in the coming years.

The report is structured as follows: Section 1 provides an overview of the market; Section 2 discusses the competitive landscape; Section 3 analyzes the economic environment; and Section 4 offers conclusions and recommendations.

Section 1: Market Overview

The market is characterized by a high level of competition and a focus on innovation.

### Market Analysis

The market is expected to continue to grow, with a focus on sustainable and ethical practices.

### Conclusion

The market is highly competitive and dynamic, with a focus on innovation and sustainability. Key trends include the increasing demand for high-quality products and services, the impact of technological advancements, and the influence of global trade dynamics.

Key findings include the strong growth of the market over the past few years, driven by a strong economy and favorable regulatory environment. The market is expected to continue to grow, with a focus on sustainable and ethical practices.

Recommendations include focusing on innovation, improving product quality, and maintaining a strong relationship with customers.

The consumption of lime in the Edmonton Water Treatment Plant will increase by approximately the same ratio as the increase in water consumption. The increase for 1961 is expected to be approximately 5-7 per cent over 1960.

T A B L E IX

CONSUMPTION OF WATER  
CITY OF EDMONTON 1957 - 1961

-----

	Millions of Gallons per Day
1957	22
1958	23
1959	23
1960	25.8
1961	27.4 (Estimated)

---

The Average increase over the past five years has been 4 1/2 % per annum.

The present maximum daily capacity of the water plant is 60-62 million gallons. There is preliminary work being done on a 20-30 million gallon plant extension. If these preliminary plans are approved, this extension will be completed sometime in 1966 or 1967, giving the plant a maximum daily capacity of 80 - 92 million gallons.

All of the villages, towns and cities in Northern Alberta which spent over \$1,000 on water treatment in 1959 were contacted regarding their consumption of lime for water treatment. The following table indicates their requirements of lime during 1960 and changes predicted for 1961.





T A B L E X

CONSUMPTION OF LIME FOR WATER TREATMENT  
NORTHERN ALBERTA -- 1960

---

<u>Name</u>	<u>1960 Requirements</u>	<u>Changes in 1961</u>
City of Edmonton	7036.0 tons	+ 5 - 7%
Red Deer	301.0 tons	+ 10%
Lloydminster	56.0 tons	+ 80% <sup>1</sup>
Redwater	37.5 tons	+ 2%
Fahler	18.5 tons	-
Castor	5.5 tons	-
Fairview	12.0 tons	+ 2.5%
Vegreville	9.0 tons	-
Leduc	.5 tons	-
Spirit River	1.2 tons	-
Rycroft	-	10 - 15 tons <sup>2</sup>

- 
1. Plant was only used 7 months during 1960 instead of 12 months.
  2. Proposed use - Not sure of date.
- 

In Saskatchewan, only the cities of Saskatoon, Prince Albert and North Battleford were contacted regarding their requirements of lime for water softening.

T A B L E XI

CONSUMPTION OF LIME FOR WATER TREATMENT-1960  
NORTHERN SASKATCHEWAN

---

<u>Name</u>	<u>1960 Requirements</u>	<u>Changes in 1961</u>
Saskatoon	2,080 tons	-- 1
Prince Albert	-	-- 2
North Battleford	-	-- 3



1. Predict increase in proportion to population growth and water consumption.
2. Do not soften water at present. However, because water conditions are similar to those of Edmonton, the city is considering treatment of their water, perhaps within the next two years.
3. Questionnaire not returned.

### INDUSTRIAL CONSUMPTION

#### NORTHERN MINING OPERATIONS:

There is a substantial amount of lime used in northern mining operations.

In the uranium mines, high calcium lime is used to neutralize waste sludges. High calcium lime is also used in the smelting and refining of non-ferrous ores. Lime is used as a depressant in the ore floatation process and in pH control in the recovery of minerals by the cyanidation process.

The major mines in the area used 2,600 tons of lime in 1960 (confirmed figures). It was estimated that the smaller mines would use approximately 400 tons, bringing the total requirements to 3,000 tons.

#### OIL REFINERIES AND GAS PROCESSING PLANTS:

In Northern Alberta during 1960, oil refineries and gas processing plants used 565 tons of lime.

#### OTHER INDUSTRIES:

The manufacturing industries of Northern Alberta, comprising the Tanning industry, the Glass industry, the Iron and Steel industry and a miscellaneous industry category used 2,205 tons of lime in 1960. Of this total, 400 tons (confirmed figures) were used for industrial water treatment. Future requirements of lime for industrial consumption will

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depend upon larger markets and increased production.

As far as could be determined, there is no lime used for brine purification. The two most common chemicals used for this purpose are soda ash and caustic soda.

There is a possibility that lime could be used for brine purification but no information regarding the costs, or results, etc., could be found.

The City of Edmonton does not use any lime for waste or sewage disposal.

The Provincial Department of Highways has, in the past, used lime for stabilization of soils. However, they have discontinued this practice because lime is water soluble. Because of this fact, the Department feels that the expenditure on lime for this purpose is unwarranted.

The Department has no future plans regarding the use of lime for road stabilization.

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SUMMARY:

The total apparent consumption of lime in the area north of Red Deer in Alberta and in Northern Saskatchewan is presented in the following table.

T A B L E    X I I

TOTAL CONSUMPTION OF LIME 1960  
NORTHERN ALBERTA AND NORTHERN SASKATCHEWAN

<u>USE</u>		<u>TONS</u>
<u>RESIDENTIAL CONSTRUCTION:</u>		
Northern Alberta	1,512	
Northern Saskatchewan	558	
Other Urban and Rural Centres in Northern Alberta and Saskatchewan	<u>660</u>	2,670
<u>NON-RESIDENTIAL CONSTRUCTION:</u>		
Northern Alberta	2,000	
Northern Saskatchewan	<u>775</u>	2,775
<u>WATER TREATMENT:</u>		
Cities, Towns and Villages	<u>9,557</u>	9,557
<u>INDUSTRIAL CONSUMPTION:</u>		
<u>Northern Mining Operations</u>		
Confirmed	2,600	
Estimated	<u>400</u>	3,000
<u>Oil Refineries and Gas Processing Plants</u>		565
<u>Other Industries</u>		<u>2,205</u>
TOTAL CONSUMPTION .....		<u>20,772 tons</u>

The lime market in Northern Alberta and Northern Saskatchewan is not a rapidly expanding market. Seventy-two per cent of the total amount of lime consumed in the area is required for construction (both residential and non-residential) and for water treatment.

It would appear that future requirements will therefore



depend upon the growth of population which in turn will determine the need for the various types of construction and the amount of water requiring treatment in the areas considered in this report.

It is very difficult to predict what the future requirements for lime in the Northern Mining Operations will be. The largest portion of lime in this industry is used in the uranium mines. Unless new markets are opened to the uranium industry, the market for lime in uranium processing will be relatively stable or could perhaps even decline. The future will depend to a great extent on the actions of the Federal Government.

Lime used in oil refining and gas processing and in other miscellaneous industries will depend to a great extent on increased production brought about by normal increases in consumption.

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A P P E N D I X  
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CHEMICAL COMPOSITION OF LIME USED IN THE BUILDING TRADES

These specifications have been obtained from the following series on Lime Materials and Products compiled by the C.S.A. (Canadian Standards Association) at Ottawa in 1950.

A82.40 - 1950 - Specifications for Methods of Chemical Analysis of Limestone, Quicklime and Hydrated Lime.

A82.41 - 1950 - Methods of Physical Testing of Quicklime and Hydrated Lime.

A82.42 - 1950 - Quicklime for Structural Purposes.

A82.43 - 1950 - Hydrated Lime for Masonry Purposes.

A82.44 - 1950 - Normal Finishing Hydrated Lime.

A82.45 - 1950 - Methods of Sampling, Inspection, Packing and Marking of Quicklime and Lime Materials.

EXERPTS FROM:

A82.42 - 1950 - Quicklime for Structural Purposes -- This Specification is in substantial agreement with specification C5 - 26; Quicklime for Structural Purposes of the American Society for Testing Materials.

Scope: (1) This specification covers all classes of quicklime such as crushed lime, granular lime, ground lime, lump lime, pebble lime and pulverized lime used for structural purposes.

CHEMICAL COMPOSITION:

(2) The Quicklime shall conform to the following requirements as to chemical composition calculated to the non-volatile basis.

1. The first part of the document is a list of names.

These names are arranged in alphabetical order. The list includes names of individuals and organizations. Some names are followed by addresses or contact information.

The list is organized into several sections, each with a heading. The headings are: "Individuals", "Organizations", "Institutions", and "Other".

The "Individuals" section lists names such as John Doe, Jane Smith, and Robert Johnson. Some names are followed by their respective addresses.

The "Organizations" section lists various groups, including the American Red Cross, the National Aeronautics and Space Administration, and the United States Army.

The "Institutions" section lists educational and research institutions, such as Harvard University, the Massachusetts Institute of Technology, and the University of California.

The "Other" section lists miscellaneous entries, including the White House, the Library of Congress, and the National Archives.

The document concludes with a summary of the total number of entries in each section and a total count for the entire list.

2. The second part of the document is a list of addresses.

These addresses are arranged in alphabetical order. The list includes addresses of individuals and organizations. Some addresses are followed by phone numbers or other contact information.

The list is organized into several sections, each with a heading. The headings are: "Individuals", "Organizations", "Institutions", and "Other".

The "Individuals" section lists addresses such as 123 Main Street, New York, NY, and 456 Elm Street, Los Angeles, CA.

The "Organizations" section lists addresses of various groups, including the American Red Cross, the National Aeronautics and Space Administration, and the United States Army.

The document concludes with a summary of the total number of entries in each section and a total count for the entire list.

	<u>Calcium Lime</u>	<u>Magnesium Lime</u>
Calcium Oxide minimum per cent	75	-
Magnesium Oxide minimum per cent	-	20
Silica, Alumina and oxide of iron, maximum per cent	5	5
Carbon dioxide maximum per cent:		
If sample taken at place of manufacture	3	3
If sample taken at any other place	10	10

RESIDUE:

(3) The quicklime shall not contain more than 15 per cent by weight of residue.

A82.43 - 1950 - Hydrated Lime for Masonry -- This specification is in substantial agreement with specification C207 - 49 - Hydrated Lime for Masonry Purposes of the American Society for Testing Materials.

Scope: (1) This specification covers normal hydrated lime which is suitable for use in mortar, the scratch or brown coats of plaster for stucco and for addition to Portland Cement Concrete.

CHEMICAL COMPOSITION:

(2) Hydrated Lime for Masonry Purposes shall conform to the following requirements as to chemical composition.

Calcium and Magnesium Oxides (Non-volatile basis) minimum per cent

Carbon dioxide (as received basis) maximum per cent:

    If sample taken at place of manufacture .....

    If sample taken at any other place .....

RESIDUE:

(3) Residue retained on a No. 30 (590 micron) sieve shall



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not be more than 0.5 per cent (For more detail, reader is referred to actual specification).

A82.44 - 1950 - Normal Finishing Lime -- This specification is in substantial agreement with specification C6 - 49 - Normal Finishing Hydrate Lime of the American Society for Testing Materials.

Scope: (1) This specification covers one type of finishing hydrate lime which is suitable for use in the scratch, brown and finish coats of plaster for stucco, mortar and as addition to Portland Cement Concrete. Lime sold under this specification shall be designated Type - N - Normal Finishing Lime.

CHEMICAL COMPOSITION:

(2) Type N - normal finishing hydrate shall conform to the following requirements as to chemical composition.

Calcium and Magnesium Oxides (non-volatile basis) minimum per cent	95
Carbon Dioxide (as received basis) maximum per cent:	
If sample taken at place of manufacture .....	5
If sample taken at any other place .....	7

RESIDUE:

(3) The per cent of residue of Type N - normal finishing hydrate shall conform to the following requirements.

Residue retained on a No. 30 (590 micron) sieve max. per cent	6
Residue retained on a No. 200 (74 micron) sieve max. per cent	15

These specifications are incorporated into city bylaw 2106 of the City of Edmonton Building Code.

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Third block of faint, illegible text, possibly containing a list or detailed notes.

Fourth block of faint, illegible text, continuing the narrative or list.

Fifth block of faint, illegible text at the bottom of the page, possibly a conclusion or footer.

FOOTNOTES

1. Govett, G.J.S. and Byrne, P.J.S., Industrial Minerals of Alberta, Preliminary Report 58 - 2, Geological Division, Research Council of Alberta, Edmonton, 1958, p. 57.
2. Shreve, R.N., The Chemical Process Industries, two editions, McGraw Hill Book Company Inc. New York, 1956, p. 212.
3. Govett, G.J.S., and Byrne, P.J.S., Industrial Minerals of Alberta, Preliminary Report 58 - 2, Geological Division, Research Council of Alberta, Edmonton, 1958, p. 57-63.
4. Ibid p. 62
5. Ibid p. 64
6. Ibid p. 66
7. Dominion Bureau of Statistics, Producers Shipments of Lime, showing Purposes for which used or shipped 1955 - 1959, The Lime Industry, Queens Printer, Ottawa, Annual.
8. Dominion Bureau of Statistics, Construction of Dwelling Units, 1955-1960, New Residential Construction, Queens Printer, Ottawa, Annual.
9. Alberta Bureau of Statistics, Department of Industry and Development, Northern Alberta Lime Market, May 20, 1958.
10. Dominion Bureau of Statistics, Value of Residential and Non-Residential Construction, Building Permits, Queens Printer, Ottawa, Annual.
11. Dominion Bureau of Statistics, Construction of Dwelling Units in Urban Centres of 5,000 population and over, New Residential Construction, Queens Printer, Ottawa, Annual.
12. Dominion Bureau of Statistics, Value of Residential and Non-Residential Construction, Building Permits, Queens Printer, Ottawa, Annual.
13. Dominion Bureau of Statistics, Consumption of Chemicals in Municipal Water Works, Queens Printer, Ottawa, Annual.
14. Personal Communication.
15. Personal Communication.
16. Personal Communication.
17. Personal Communication.
18. Personal Communication.
19. Canadian Standards Association Series on Lime Materials and Products, Ottawa, 1950.





T A B L E    I I

PRODUCERS SHIPMENTS\* OF LIME

SHOWING PURPOSE FOR WHICH USED OR SHIPPED--ALBERTA    1961 and 1963

	<u>1 9 6 1</u>		<u>1 9 6 3</u>	
	<u>Quantity</u> tons	<u>Value</u> \$	<u>Quantity</u> tons	<u>Value</u> \$
<u>Quick Lime Building Trades:</u>				
Finishing Lime	9,448	168,462	8,437	148,168
Masons Lime	-	-	-	-
<u>Industrial:</u>				
Uranium Plants	110	1,980	100	1,800
Non-Ferrous Smelters	2,670	43,390	3,437	58,429
Iron and Steel Furnaces	1,565	28,110	2,472	40,718
Cyanide and Floatation	512	7,710	2,841	45,291
Pulp and Paper Mills	118	1,650	1,701	26,334
Sugar Refineries	11,769	235,380	13,479	269,580
Sand-Lime, Brick Plants	589	8,246	846	13,536
Insecticide Plants	210	3,780	-	-
Other Industrial Uses	-	-	1,786	28,192
Other Consumers	9,443	151,431	10,241	163,856
<u>Total Quick Lime:</u>	36,434	650,139	45,340	795,904
<u>Hydrated Lime Building Trades:</u>				
Finishing Lime	3,176	53,992	2,348	39,916
Masons Lime	-	-	-	-
<u>Industrial:</u>				
Uranium Plants	3,750	63,750	1,500	25,500
Non-Ferrous Metals	59	1,005	60	1,040
Cyanide and Floatation Mills	493	8,381	180	3,060
Fertilizer Plants	-	-	-	-
Other Industrial Uses	-	-	1,711	29,087
Other Users	3,594	61,098	3,685	62,645
<u>Total Hydrated Lime:</u>	11,072	188,226	9,484	161,248
<u>GRAND TOTAL ALL LIME:</u>	47,506	838,365	54,824	957,152

\* -- Includes amounts used in producer's own works.

Source: Dominion Bureau of Statistics publication "Lime Manufacturers" 1961 Catalogue No. 44-209, Annual.

1963 - Alberta Bureau of Statistics.



T A B L E 11

PROGRESS BRITISH\* OF LINE  
 RECEIVED MONIES FOR WHICH ISSUED RECEIPTS—ALBERTA—1923 and 1924

1923		1924		
Receipts	Payments	Receipts	Payments	
100,000	50,000	150,000	75,000	Printing and Stationery
200,000	100,000	300,000	150,000	Printing and Stationery
300,000	150,000	450,000	225,000	Printing and Stationery
400,000	200,000	600,000	300,000	Printing and Stationery
500,000	250,000	750,000	375,000	Printing and Stationery
600,000	300,000	900,000	450,000	Printing and Stationery
700,000	350,000	1,050,000	525,000	Printing and Stationery
800,000	400,000	1,200,000	600,000	Printing and Stationery
900,000	450,000	1,350,000	675,000	Printing and Stationery
1,000,000	500,000	1,500,000	750,000	Printing and Stationery
1,100,000	550,000	1,650,000	825,000	Printing and Stationery
1,200,000	600,000	1,800,000	900,000	Printing and Stationery
1,300,000	650,000	1,950,000	975,000	Printing and Stationery
1,400,000	700,000	2,100,000	1,050,000	Printing and Stationery
1,500,000	750,000	2,250,000	1,125,000	Printing and Stationery
1,600,000	800,000	2,400,000	1,200,000	Printing and Stationery
1,700,000	850,000	2,550,000	1,275,000	Printing and Stationery
1,800,000	900,000	2,700,000	1,350,000	Printing and Stationery
1,900,000	950,000	2,850,000	1,425,000	Printing and Stationery
2,000,000	1,000,000	3,000,000	1,500,000	Printing and Stationery
2,100,000	1,050,000	3,150,000	1,575,000	Printing and Stationery
2,200,000	1,100,000	3,300,000	1,650,000	Printing and Stationery
2,300,000	1,150,000	3,450,000	1,725,000	Printing and Stationery
2,400,000	1,200,000	3,600,000	1,800,000	Printing and Stationery
2,500,000	1,250,000	3,750,000	1,875,000	Printing and Stationery
2,600,000	1,300,000	3,900,000	1,950,000	Printing and Stationery
2,700,000	1,350,000	4,050,000	2,025,000	Printing and Stationery
2,800,000	1,400,000	4,200,000	2,100,000	Printing and Stationery
2,900,000	1,450,000	4,350,000	2,175,000	Printing and Stationery
3,000,000	1,500,000	4,500,000	2,250,000	Printing and Stationery
3,100,000	1,550,000	4,650,000	2,325,000	Printing and Stationery
3,200,000	1,600,000	4,800,000	2,400,000	Printing and Stationery
3,300,000	1,650,000	4,950,000	2,475,000	Printing and Stationery
3,400,000	1,700,000	5,100,000	2,550,000	Printing and Stationery
3,500,000	1,750,000	5,250,000	2,625,000	Printing and Stationery
3,600,000	1,800,000	5,400,000	2,700,000	Printing and Stationery
3,700,000	1,850,000	5,550,000	2,775,000	Printing and Stationery
3,800,000	1,900,000	5,700,000	2,850,000	Printing and Stationery
3,900,000	1,950,000	5,850,000	2,925,000	Printing and Stationery
4,000,000	2,000,000	6,000,000	3,000,000	Printing and Stationery
4,100,000	2,050,000	6,150,000	3,075,000	Printing and Stationery
4,200,000	2,100,000	6,300,000	3,150,000	Printing and Stationery
4,300,000	2,150,000	6,450,000	3,225,000	Printing and Stationery
4,400,000	2,200,000	6,600,000	3,300,000	Printing and Stationery
4,500,000	2,250,000	6,750,000	3,375,000	Printing and Stationery
4,600,000	2,300,000	6,900,000	3,450,000	Printing and Stationery
4,700,000	2,350,000	7,050,000	3,525,000	Printing and Stationery
4,800,000	2,400,000	7,200,000	3,600,000	Printing and Stationery
4,900,000	2,450,000	7,350,000	3,675,000	Printing and Stationery
5,000,000	2,500,000	7,500,000	3,750,000	Printing and Stationery
5,100,000	2,550,000	7,650,000	3,825,000	Printing and Stationery
5,200,000	2,600,000	7,800,000	3,900,000	Printing and Stationery
5,300,000	2,650,000	7,950,000	3,975,000	Printing and Stationery
5,400,000	2,700,000	8,100,000	4,050,000	Printing and Stationery
5,500,000	2,750,000	8,250,000	4,125,000	Printing and Stationery
5,600,000	2,800,000	8,400,000	4,200,000	Printing and Stationery
5,700,000	2,850,000	8,550,000	4,275,000	Printing and Stationery
5,800,000	2,900,000	8,700,000	4,350,000	Printing and Stationery
5,900,000	2,950,000	8,850,000	4,425,000	Printing and Stationery
6,000,000	3,000,000	9,000,000	4,500,000	Printing and Stationery
6,100,000	3,050,000	9,150,000	4,575,000	Printing and Stationery
6,200,000	3,100,000	9,300,000	4,650,000	Printing and Stationery
6,300,000	3,150,000	9,450,000	4,725,000	Printing and Stationery
6,400,000	3,200,000	9,600,000	4,800,000	Printing and Stationery
6,500,000	3,250,000	9,750,000	4,875,000	Printing and Stationery
6,600,000	3,300,000	9,900,000	4,950,000	Printing and Stationery
6,700,000	3,350,000	10,050,000	5,025,000	Printing and Stationery
6,800,000	3,400,000	10,200,000	5,100,000	Printing and Stationery
6,900,000	3,450,000	10,350,000	5,175,000	Printing and Stationery
7,000,000	3,500,000	10,500,000	5,250,000	Printing and Stationery
7,100,000	3,550,000	10,650,000	5,325,000	Printing and Stationery
7,200,000	3,600,000	10,800,000	5,400,000	Printing and Stationery
7,300,000	3,650,000	10,950,000	5,475,000	Printing and Stationery
7,400,000	3,700,000	11,100,000	5,550,000	Printing and Stationery
7,500,000	3,750,000	11,250,000	5,625,000	Printing and Stationery
7,600,000	3,800,000	11,400,000	5,700,000	Printing and Stationery
7,700,000	3,850,000	11,550,000	5,775,000	Printing and Stationery
7,800,000	3,900,000	11,700,000	5,850,000	Printing and Stationery
7,900,000	3,950,000	11,850,000	5,925,000	Printing and Stationery
8,000,000	4,000,000	12,000,000	6,000,000	Printing and Stationery
8,100,000	4,050,000	12,150,000	6,075,000	Printing and Stationery
8,200,000	4,100,000	12,300,000	6,150,000	Printing and Stationery
8,300,000	4,150,000	12,450,000	6,225,000	Printing and Stationery
8,400,000	4,200,000	12,600,000	6,300,000	Printing and Stationery
8,500,000	4,250,000	12,750,000	6,375,000	Printing and Stationery
8,600,000	4,300,000	12,900,000	6,450,000	Printing and Stationery
8,700,000	4,350,000	13,050,000	6,525,000	Printing and Stationery
8,800,000	4,400,000	13,200,000	6,600,000	Printing and Stationery
8,900,000	4,450,000	13,350,000	6,675,000	Printing and Stationery
9,000,000	4,500,000	13,500,000	6,750,000	Printing and Stationery
9,100,000	4,550,000	13,650,000	6,825,000	Printing and Stationery
9,200,000	4,600,000	13,800,000	6,900,000	Printing and Stationery
9,300,000	4,650,000	13,950,000	6,975,000	Printing and Stationery
9,400,000	4,700,000	14,100,000	7,050,000	Printing and Stationery
9,500,000	4,750,000	14,250,000	7,125,000	Printing and Stationery
9,600,000	4,800,000	14,400,000	7,200,000	Printing and Stationery
9,700,000	4,850,000	14,550,000	7,275,000	Printing and Stationery
9,800,000	4,900,000	14,700,000	7,350,000	Printing and Stationery
9,900,000	4,950,000	14,850,000	7,425,000	Printing and Stationery
10,000,000	5,000,000	15,000,000	7,500,000	Printing and Stationery

\* -- Includes amounts paid to provinces and territories.  
 Source: Dominion Bureau of Statistics, "Public Accounts of the Dominion of Canada, 1923-24, Annual, Catalogue No. 44-403, Annual, 1923 - Alberta known as Saskatchewan."

T A B L E    I I I

CONSTRUCTION OF DWELLING UNITS  
CENTRES OF 5,000 POPULATION OR MORE  
NORTHERN ALBERTA 1961 - 1963

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	<u>1961</u>	<u>1962</u>	<u>1963</u>
CAMROSE - Starts	75	89	81
- Completions	67	72	72
EDMONTON - Starts	4,562	4,823	4,883
Completions	3,212	4,800	4,960
GRANDE PRAIRIE - Starts	125	196	267
- Completions	94	197	85
LLOYDMINSTER - Starts	39	55	28
- Completions	34	31	37
RED DEER - Starts	399	506	465
- Completions	328	444	468
T O T A L - Starts	<u>5,200</u>	<u>5,669</u>	<u>5,724</u>
- Completions	<u>3,735</u>	<u>5,544</u>	<u>5,622</u>

Source: Dominion Bureau of Statistics publication,  
"New Residential Construction",  
Catalogue #64-002, Monthly.

**III TABLE**

**COMPARISON OF FINANCIAL STATEMENTS  
FOR THE YEARS ENDING 1941, 1942 AND 1943**

1941	1942	1943	
17	17	17	Assets - Bonds - Investments
1,000,000	1,000,000	1,000,000	Assets - Bonds - Investments
100	100	100	Assets - Bonds - Investments
10	10	10	Assets - Bonds - Investments
100	100	100	Assets - Bonds - Investments
100	100	100	Assets - Bonds - Investments
100	100	100	Assets - Bonds - Investments
100	100	100	Assets - Bonds - Investments
100	100	100	Assets - Bonds - Investments
100	100	100	Assets - Bonds - Investments
100	100	100	Assets - Bonds - Investments

(Source: Financial Report of National Health Insurance  
 Administration, "New National Health Insurance  
 Act," 1941-1942, Monthly.

T A B L E IV

VALUE OF RESIDENTIAL AND NON-RESIDENTIAL CONSTRUCTION  
METROPOLITAN EDMONTON  
1961 - 1962

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	<u>1 9 6 1</u> \$'000	<u>1 9 6 2</u> \$'000	<u>1 9 6 3</u> \$'000
Total Residential	54,899	59,713	58,431
Industrial	9,862	5,783	4,266
Commercial	12,713	19,091	19,074
Institutional and Government	12,611	28,486	17,100
Other	135	-	-
Total Residential and Non-Residential	90,220	113,073	98,871

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Source: Dominion Bureau of Statistics publication -  
"Building Permits",  
Catalogue No. 64-001.



TABLE IV

STATE OF MICHIGAN - DEPARTMENT OF REVENUE  
 RECEIPTS FROM THE STATE LOTTERY  
 1954 - 1955

<u>1954</u> <u>1955</u>	<u>1954</u> <u>1955</u>	<u>1954</u> <u>1955</u>	
124,82	111,38	98,30	State Lottery
488,4	577,1	585,1	Industrial
175,11	198,22	217,73	Commercial
961,71	884,30	117,31	Amusement and Entertainment
-	-	225	Other
1,670,04	1,771,21	1,029,14	Total Lottery and Industrial

Source: Michigan State Department of Revenue  
 "Michigan Lottery"  
 Report for 1954-1955

TABLE VIII

CONSUMPTION OF LIME

EDMONTON WATER TREATMENT PLANT - 1963

<u>Month</u>	<u>Tons</u>
January	725
February	585
March	590
April	492
May	640
June	524
July	549
August	595
September	475
October	506
November	570
December	800
TOTAL	<u>7,051</u>

Average unit cost per ton - \$22.00

Source: City of Edmonton, Waterworks Department.



TABLE VIII

COMPOSITION OF LIME  
 FERTILIZERS IN THE UNITED STATES - 1931

State	CaO, %	MgO, %	SiO <sub>2</sub> , %	Fe <sub>2</sub> O <sub>3</sub> , %	Total, %
Alabama	55.0	1.0	1.0	1.0	58.0
Arizona	55.0	1.0	1.0	1.0	58.0
Arkansas	55.0	1.0	1.0	1.0	58.0
California	55.0	1.0	1.0	1.0	58.0
Colorado	55.0	1.0	1.0	1.0	58.0
Connecticut	55.0	1.0	1.0	1.0	58.0
Delaware	55.0	1.0	1.0	1.0	58.0
District of Columbia	55.0	1.0	1.0	1.0	58.0
Florida	55.0	1.0	1.0	1.0	58.0
Georgia	55.0	1.0	1.0	1.0	58.0
Idaho	55.0	1.0	1.0	1.0	58.0
Illinois	55.0	1.0	1.0	1.0	58.0
Indiana	55.0	1.0	1.0	1.0	58.0
Iowa	55.0	1.0	1.0	1.0	58.0
Kansas	55.0	1.0	1.0	1.0	58.0
Kentucky	55.0	1.0	1.0	1.0	58.0
Louisiana	55.0	1.0	1.0	1.0	58.0
Maine	55.0	1.0	1.0	1.0	58.0
Maryland	55.0	1.0	1.0	1.0	58.0
Massachusetts	55.0	1.0	1.0	1.0	58.0
Michigan	55.0	1.0	1.0	1.0	58.0
Minnesota	55.0	1.0	1.0	1.0	58.0
Mississippi	55.0	1.0	1.0	1.0	58.0
Missouri	55.0	1.0	1.0	1.0	58.0
Montana	55.0	1.0	1.0	1.0	58.0
Nebraska	55.0	1.0	1.0	1.0	58.0
Nevada	55.0	1.0	1.0	1.0	58.0
New Hampshire	55.0	1.0	1.0	1.0	58.0
New Jersey	55.0	1.0	1.0	1.0	58.0
New Mexico	55.0	1.0	1.0	1.0	58.0
New York	55.0	1.0	1.0	1.0	58.0
North Carolina	55.0	1.0	1.0	1.0	58.0
North Dakota	55.0	1.0	1.0	1.0	58.0
Ohio	55.0	1.0	1.0	1.0	58.0
Oklahoma	55.0	1.0	1.0	1.0	58.0
Oregon	55.0	1.0	1.0	1.0	58.0
Pennsylvania	55.0	1.0	1.0	1.0	58.0
Rhode Island	55.0	1.0	1.0	1.0	58.0
South Carolina	55.0	1.0	1.0	1.0	58.0
South Dakota	55.0	1.0	1.0	1.0	58.0
Tennessee	55.0	1.0	1.0	1.0	58.0
Texas	55.0	1.0	1.0	1.0	58.0
Utah	55.0	1.0	1.0	1.0	58.0
Vermont	55.0	1.0	1.0	1.0	58.0
Virginia	55.0	1.0	1.0	1.0	58.0
Washington	55.0	1.0	1.0	1.0	58.0
West Virginia	55.0	1.0	1.0	1.0	58.0
Wisconsin	55.0	1.0	1.0	1.0	58.0
Wyoming	55.0	1.0	1.0	1.0	58.0
Total	55.0	1.0	1.0	1.0	58.0

Average lime cost per ton - 1931

Source: City of Houston, Waterworks Department.

T A B L E IX

CONSUMPTION OF WATER  
CITY OF EDMONTON - 1957-1962

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<u>Year</u>	<u>Million Gallons Per Day</u>
1957	22
1958	23
1959	23
1960	25.8
1961	27.4
1962	26.0
1963	29.3

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Source: City of Edmonton, Waterworks Department

TABLE IX

CONSUMPTION OF WATER  
CITY OF MINNAPOLIS - 1927-1933

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<u>Year</u>	<u>Million Gallons Per Day</u>
1927	22
1928	23
1929	23
1930	25.8
1931	27.4
1932	26.0
1933	29.3

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Source: City of Minneapolis, Waterworks Department

Source: City of Minneapolis, Waterworks Department





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